

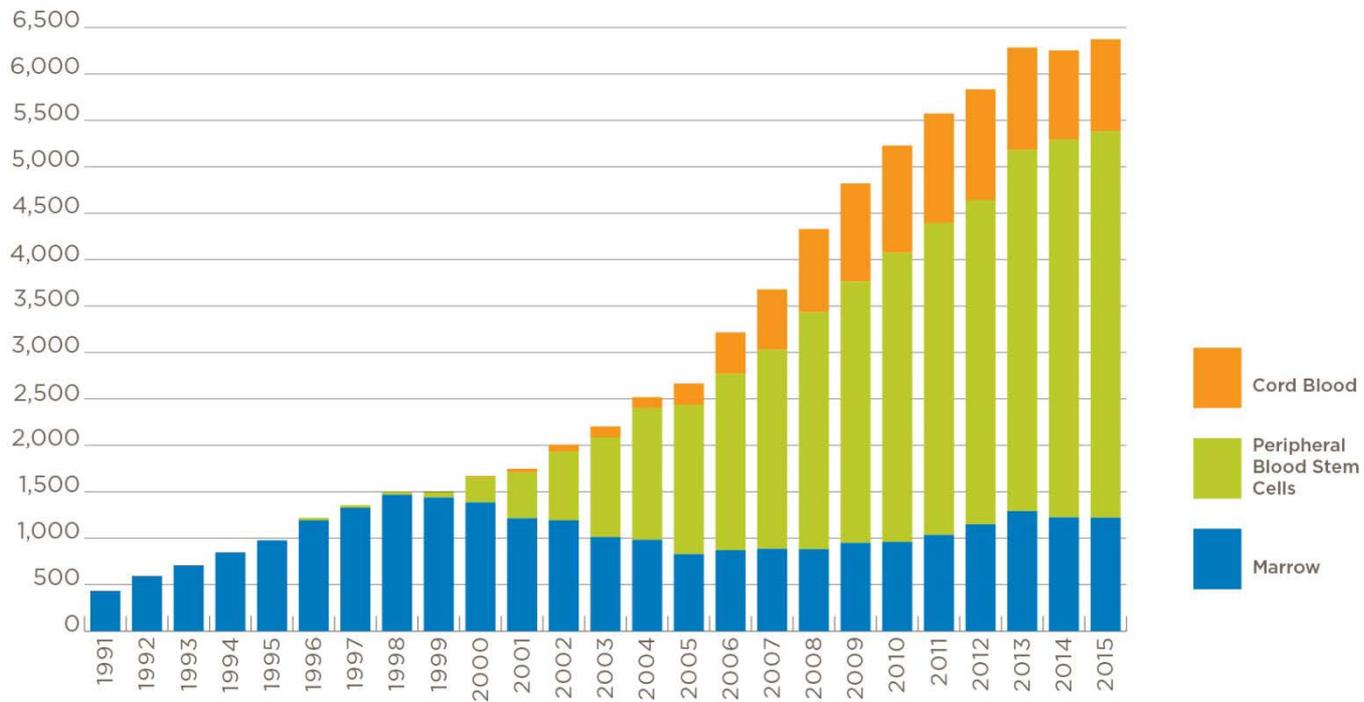


Update on Umbilical Cord Blood Activity and Financial Modeling

Michael Boo

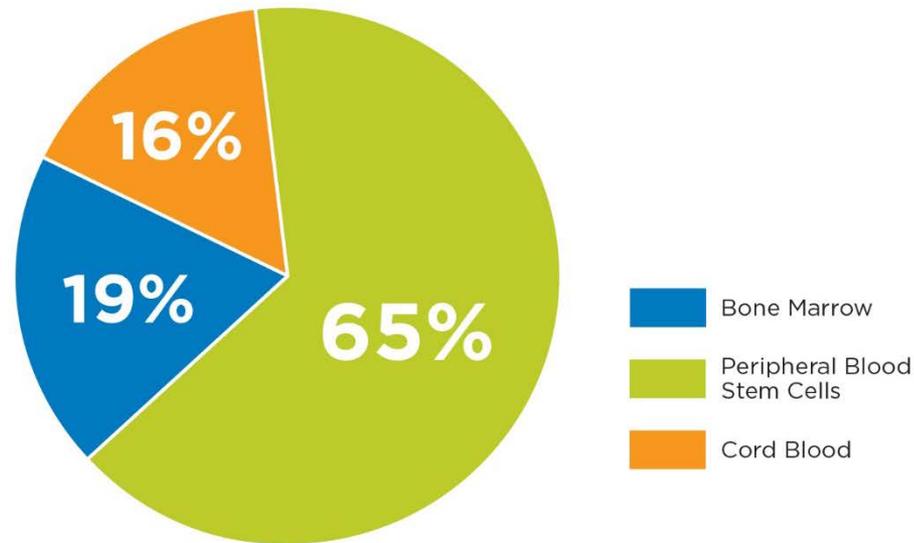
National Marrow Donor Program
Be The Match

Unrelated Transplants Through NMDP Are Not Growing



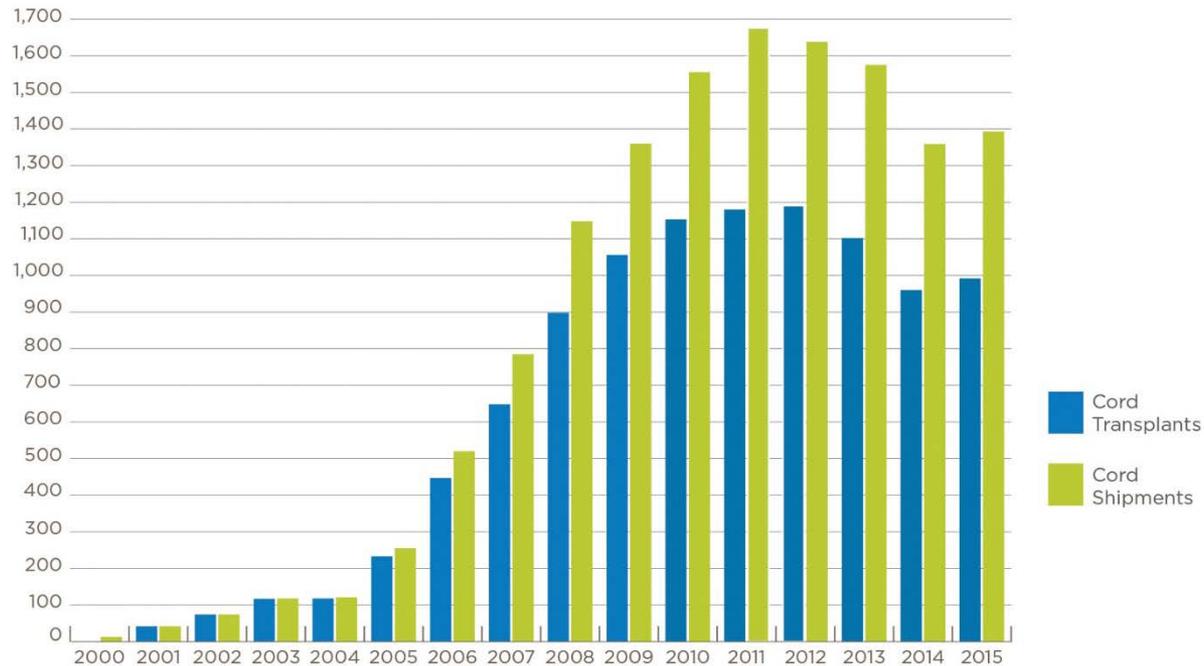
Source: National Marrow Donor Program/Be The Match FY 2015

The Distribution Continues to Show Growth in PBSC with Decline in UBC



Source: National Marrow Donor Program/Be The Match FY 2015

UCB Shipments and Transplants Grew Slightly in 2015 but Overall Trend is Lower



Source: National Marrow Donor Program/Be The Match FY 2015

Minority Inventory Growth

	CBU Banking Year						Total	% Total
	2010	2011	2012	2013	2014	2015		
Inventory TNC Below 90	1,593	972	3,485	429	1,286	1,032	8,797	13.8%
Inventory TNC 90 - 124	5,484	4,681	5,548	3,189	4,055	4,154	27,111	42.4%
Inventory TNC 125 - 149	2,274	1,964	2,425	1,698	2,126	2,052	12,539	19.6%
Inventory TNC 150 - 174	1,173	1,181	1,366	1,025	1,134	1,210	7,089	11.1%
<u>Inventory TNC Above 174</u>	<u>1,535</u>	<u>1,368</u>	<u>1,597</u>	<u>1,180</u>	<u>1,322</u>	<u>1,377</u>	<u>8,379</u>	<u>13.1%</u>
Total Inventory	12,059	10,166	14,421	7,521	9,923	9,825	63,915	100.0%
Inventory TNC Below 150	9,351	7,617	11,458	5,316	7,467	7,238	48,447	75.8%
Inventory TNC 150 and Above	2,708	2,549	2,963	2,205	2,456	2,587	15,468	24.2%

Use of UCB Transplant by Minority Patients

	<u>Total CBUs Shipped</u>				<u>Shipped as %</u>	
	Total	% Total	Pediatric	Adult	Total	of Inventory
Inventory TNC Below 90	8,797	13.8%	11	-	11	0.1%
Inventory TNC 90 - 124	27,111	42.4%	155	72	227	0.8%
Inventory TNC 125 - 149	12,539	19.6%	127	138	265	2.1%
Inventory TNC 150 - 174	7,089	11.1%	87	184	271	3.8%
<u>Inventory TNC Above 174</u>	<u>8,379</u>	<u>13.1%</u>	<u>288</u>	<u>878</u>	<u>1,166</u>	13.9%
Total Inventory	63,915	100.0%	668	1,272	1,940	3.0%
Inventory TNC Below 150	48,447	75.8%	293	210	503	1.0%
Inventory TNC 150 and Above	15,468	24.2%	375	1,062	1,437	9.3%

Caucasian Inventory Growth

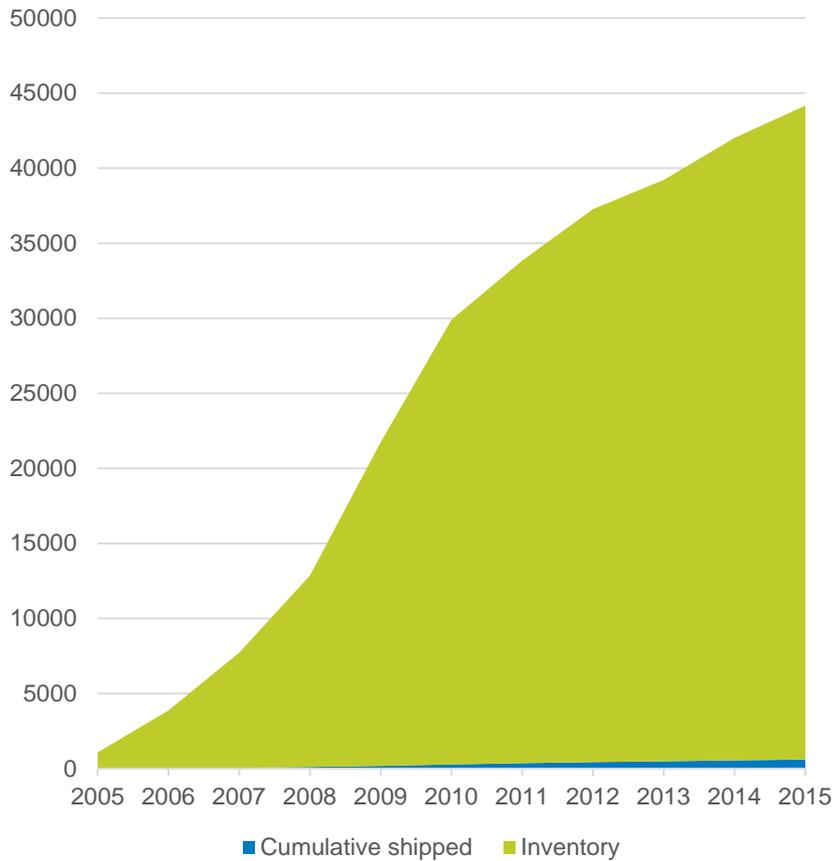
	CBU Banking Year						Total	% Total
	2010	2011	2012	2013	2014	2015		
Inventory TNC Below 90	2,457	660	220	78	297	238	3,950	6.5%
Inventory TNC 90 - 124	8,124	3,918	3,406	1,933	2,738	2,095	22,214	36.5%
Inventory TNC 125 - 149	3,583	2,388	2,483	1,695	2,086	1,725	13,960	23.0%
Inventory TNC 150 - 174	2,094	1,513	1,533	1,178	1,418	1,515	9,251	15.2%
<u>Inventory TNC Above 174</u>	<u>2,385</u>	<u>1,940</u>	<u>1,932</u>	<u>1,397</u>	<u>1,830</u>	<u>1,944</u>	<u>11,428</u>	<u>18.8%</u>
Total Inventory	18,643	10,419	9,574	6,281	8,369	7,517	60,803	100.0%
Inventory TNC Below 150	14,164	6,966	6,109	3,706	5,121	4,058	40,124	66.0%
Inventory TNC 150 and Above	4,479	3,453	3,465	2,575	3,248	3,459	20,679	34.0%

Use of UCB Transplant by Minority Patients

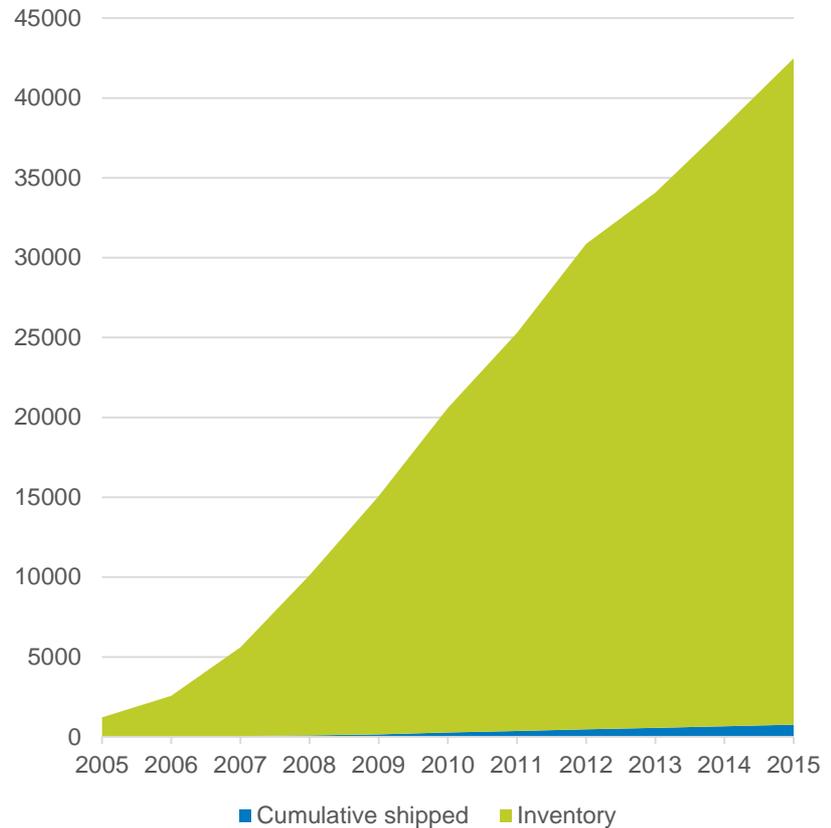
	<u>Total CBUs Shipped</u>					Shipped as % of Inventory
	Total	% Total	Pediatric	Adult	Total	
Inventory TNC Below 90	3,950	6.5%	6	1	7	0.2%
Inventory TNC 90 - 124	22,214	36.5%	80	43	123	0.6%
Inventory TNC 125 - 149	13,960	23.0%	103	124	227	1.6%
Inventory TNC 150 - 174	9,251	15.2%	82	184	266	2.9%
<u>Inventory TNC Above 174</u>	<u>11,428</u>	<u>18.8%</u>	<u>312</u>	<u>1,246</u>	<u>1,558</u>	13.6%
Total Inventory	60,803	100.0%	583	1,598	2,181	3.6%
Inventory TNC Below 150	40,124	66.0%	189	168	357	0.9%
Inventory TNC 150 and Above	20,679	34.0%	394	1,430	1,824	8.8%

Small TNC – comparing donor race

Units recruited from 2005 to 2015, split into shipped and remaining in inventory
TNC 90-124, CAUCASIAN

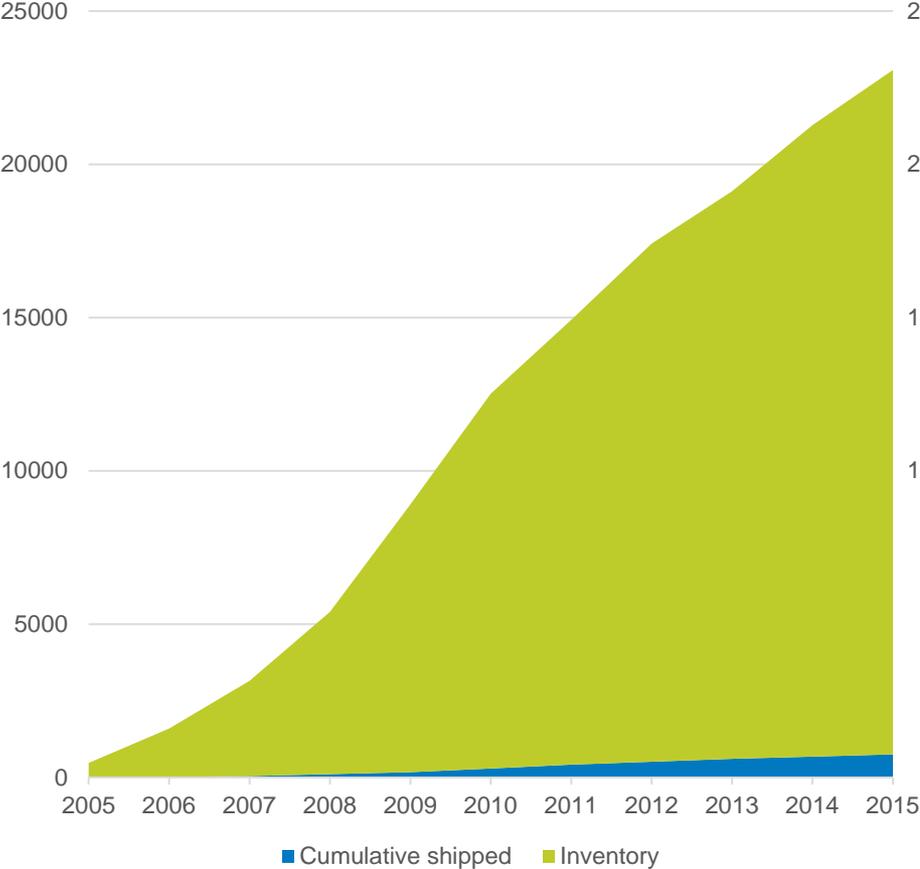


Units recruited from 2005 to 2015, split into shipped and remaining in inventory
TNC 90-124, MINORITY

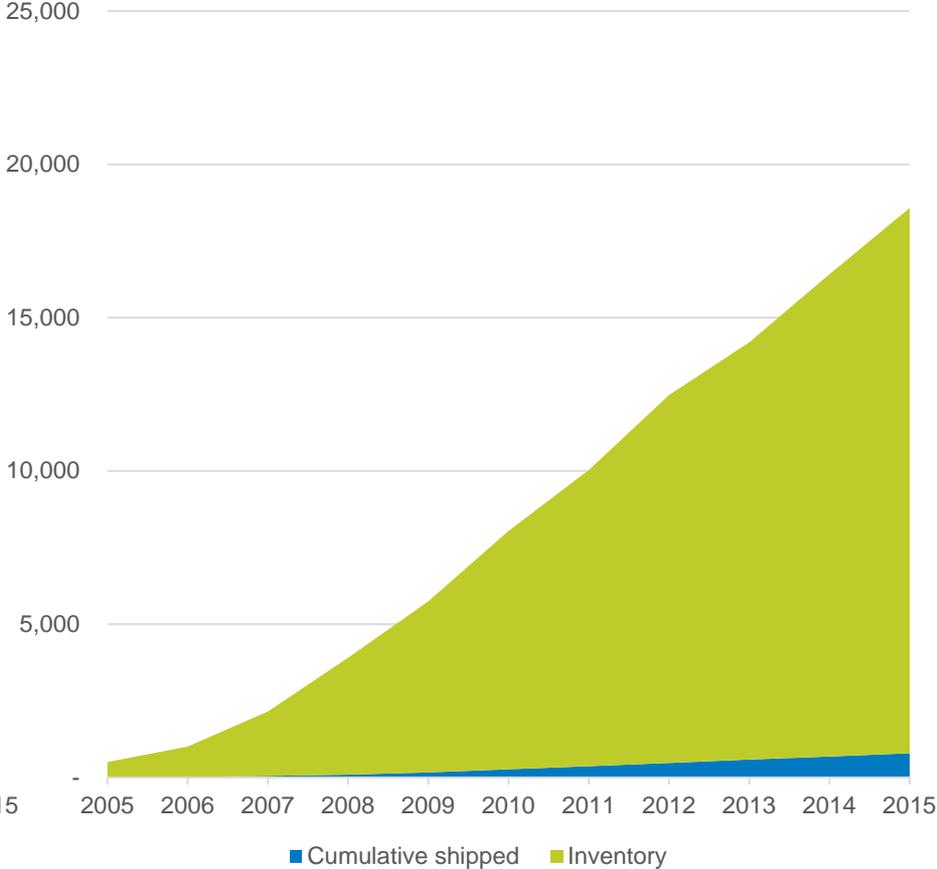


Medium TNC, comparing donor race

Units recruited from 2005 to 2015, split into shipped and remaining in inventory
TNC 125-149, CAUCASIAN

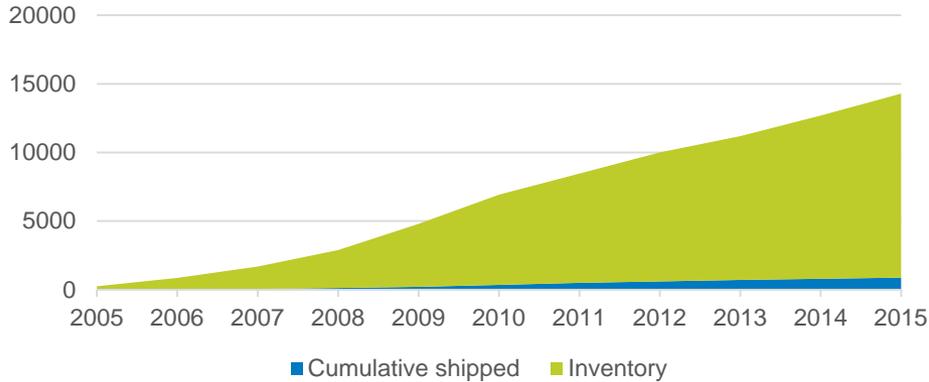


Units recruited from 2005 to 2015, split into shipped and remaining in inventory
TNC 125-149, MINORITY

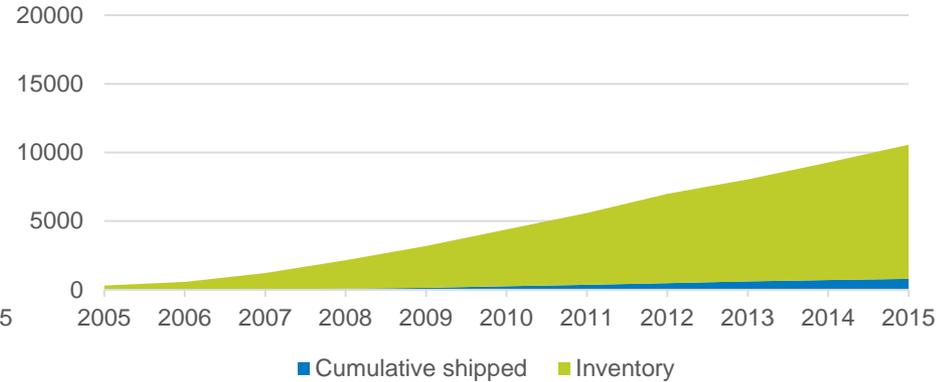


Large TNC, comparing donor race

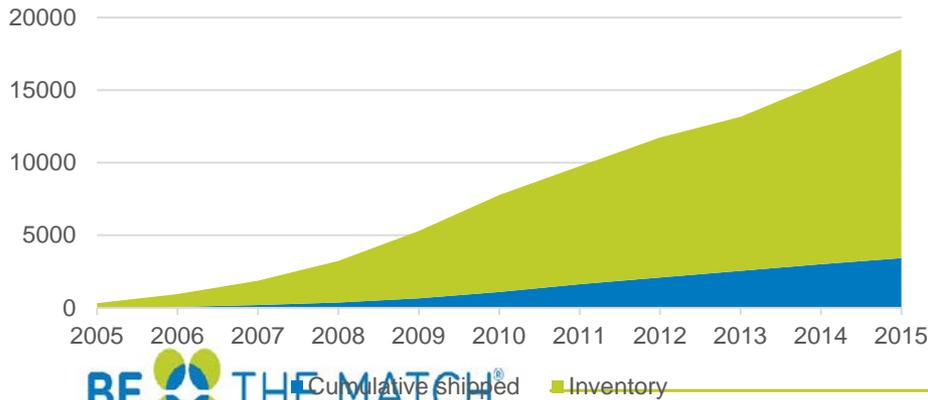
Units recruited from 2005 to 2015, split into shipped and remaining in inventory
TNC 150-175, CAUCASIAN



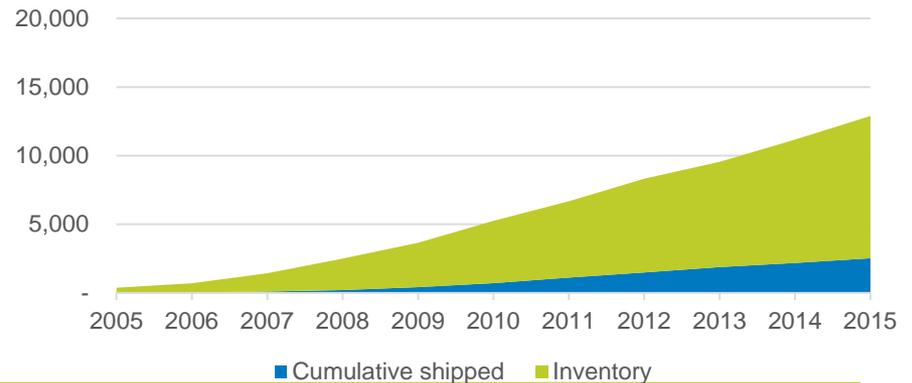
Units recruited from 2005 to 2015, split into shipped and remaining in inventory
TNC 150-175, MINORITY



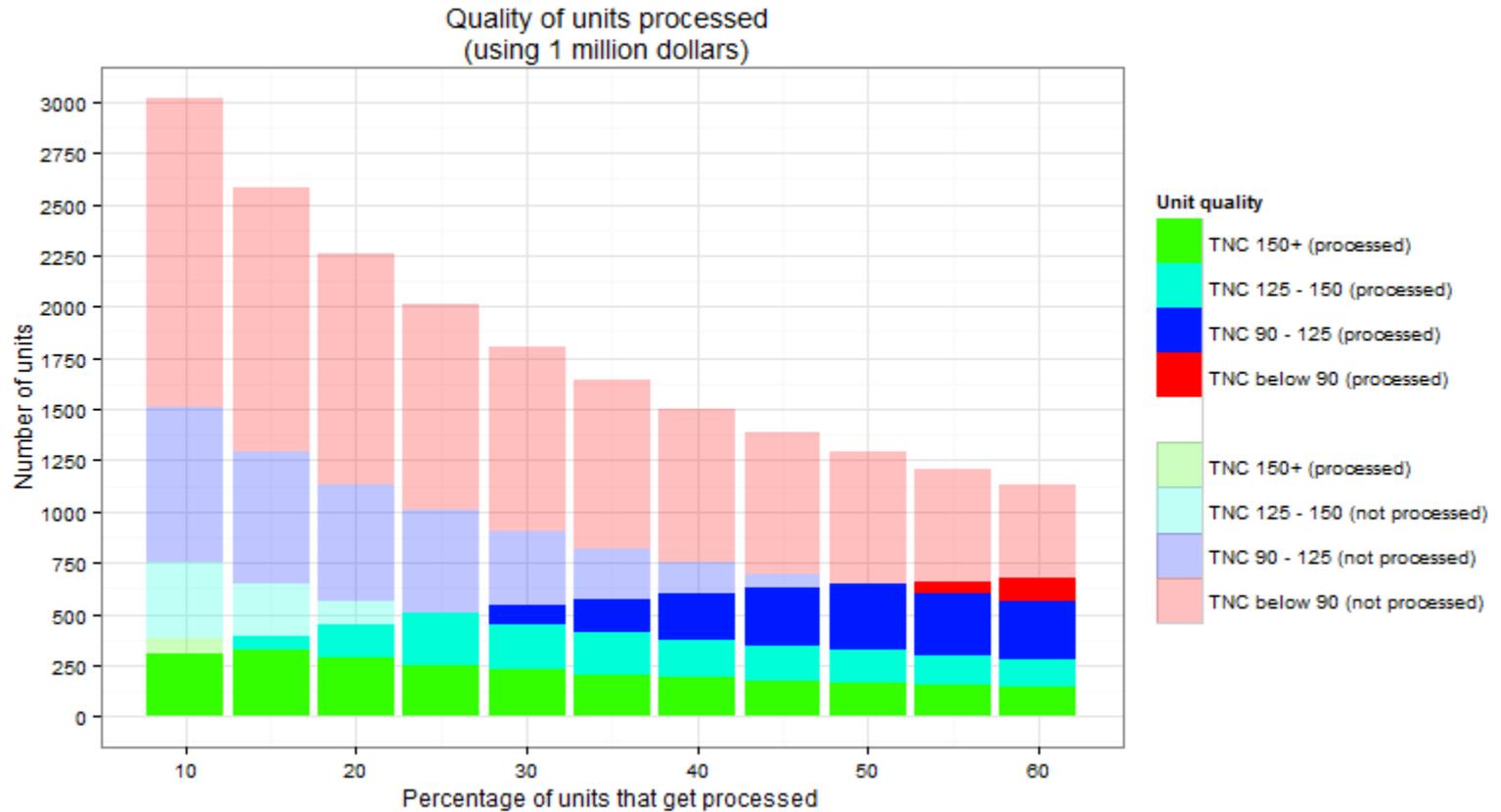
Units recruited from 2005 to 2015, split into shipped and remaining in inventory
TNC 175 and above, CAUCASIAN



recruited from 2005 to 2015, split into shipped and remaining in inventory
TNC 175 and above, MINORITY



Re-allocating resources to more collection versus banking small units increases number of high quality units collected



Cord Blood Banking Financial Modeling – NMDP Analysis

CBB Industry Financial Analysis Process

Selected four banks that represent the industry

- One licensed utilizing s for collection
- One licensed utilizing collection specialists for collection
- One not licensed utilizing OBGYNs for collection
- One not licensed utilizing collection specialists for collection

CBB Industry Financial Analysis Process

- Updated the financial model including pre- and post-licensure expenses
- Reconciled the model to one bank's budget to ensure material accuracy of the financial model
- The average data from the four banks was used to represent the industry

Current Industry Scenario

(In 000's)

	2016	2017	2018	2019	2020	2021
Total Revenue	\$ 30,483	\$ 30,483	\$ 30,483	\$ 30,483	\$ 30,483	\$ 30,483
Total Costs	\$ 58,847	\$ 60,789	\$ 62,794	\$ 64,865	\$ 67,004	\$ 69,212
Net Loss- Excluding Subsidies	\$ (28,364)	\$ (30,306)	\$ (32,311)	\$ (34,382)	\$ (36,520)	\$ (38,729)
Net Loss % of Revenue	-93%	-99%	-106%	-113%	-120%	-127%
Government Subsidies	\$ 9,363	\$ 9,363	\$ 9,363	\$ 9,363	\$ 9,363	\$ 9,363
Net Loss - Including Subsidies	\$ (19,001)	\$ (20,943)	\$ (22,948)	\$ (25,019)	\$ (27,158)	\$ (29,366)
Net Loss % of Revenue	-62%	-69%	-75%	-82%	-89%	-96%



Combination of Changes

(In 000's)

	2016	2017	2018	2019	2020	2021
Total Revenue	\$30,483	\$30,483	\$30,483	\$30,483	\$30,483	\$30,483
Total Costs	\$58,847	\$43,343	\$44,555	\$45,803	\$47,086	\$48,407
Net Loss- Excluding Subsidies	\$ (28,364)	\$ (12,860)	\$ (14,072)	\$ (15,320)	\$ (16,603)	\$ (17,924)
Net Loss % of Revenue	-93%	-42%	-46%	-50%	-54%	-59%
Government Subsidies	\$9,363	\$9,363	\$9,363	\$9,363	\$9,363	\$9,363
Net Loss - Including Subsidies	\$ (19,001)	\$ (3,497)	\$ (4,709)	\$ (5,957)	\$ (7,240)	\$ (8,561)
Net Loss % of Revenue	-62%	-11%	-15%	-20%	-24%	-28%

Assumptions:

- TNC cutoff 175
- Recruitment declines by 33% in 2017, flat remainder of years
- Sales flat each year
- Cost to recruit and process drop 1% each year
- Inflation remains at 3% each year

Combination of Changes to Breakeven

(In 000's)

	2016	2017	2018	2019	2020	2021
Total Revenue	\$30,483	\$32,301	\$34,252	\$36,302	\$38,484	\$40,798
Total Costs	<u>\$58,847</u>	<u>\$43,389</u>	<u>\$44,655</u>	<u>\$45,961</u>	<u>\$47,310</u>	<u>\$48,704</u>
Net Loss- Excluding Subsidies	\$ (28,364)	\$ (11,088)	\$ (10,403)	\$ (9,659)	\$ (8,826)	\$ (7,905)
Net Loss % of Revenue	-93%	-34%	-30%	-27%	-23%	-19%
Government Subsidies	<u>\$9,363</u>	<u>\$9,363</u>	<u>\$9,363</u>	<u>\$9,363</u>	<u>\$9,363</u>	<u>\$9,363</u>
Net Loss - Including Subsidies	\$ (19,001)	\$ (1,725)	\$ (1,040)	\$ (296)	\$ 537	\$ 1,458
Net Loss % of Revenue	-62%	-5%	-3%	-1%	1%	4%

Assumptions:

- TNC cutoff 175
- Recruitment declines by 33% in 2017, flat remainder of years
- Sales growth at 6% to breakeven by 2020
- Cost to recruit and process drop 1% each year
- Inflation remains at 3% each year

Conclusions

- The modeling to date are estimates of the current health of the industry
 - Don't reflect bank specific strategies and decisions to deal with the financial impact
- The trend has been confirmed by other studies
- The solutions remain to be discovered
 - Lowering demand changes the bar dramatically
 - Other uses for cord blood have not emerged to date but remain a possibility